Tendril Energy Management System

User's Guide

Tendril Copyright

Important Consumer Information

FCC: WFH-GWY-8-003

IC: 7785A-GWYX8X003EH

Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To comply with FCC's and Industry Canada's RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

RF Exposure (OET Bulletin 65)

To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons.

Industry Canada Statement per Section 4.0 of RSP-100

The term "IC:" before the certification / registration number only signifies that the Industry Canada technical specifications were met.

Section 7.1.5 of RSS-GEN

Operation is subject to the following two conditions:

1. this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Section 7.1.4 of RSS-GEN

This device has been designed to operate with the antenna(s) listed below, and having a maximum gain of 2.90 dB. Antennas not included in this list or having a gain greater than 2.90 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

List of all Antennas Acceptable for use with the Transmitter

This device is certified to work with the Antenna Factor antenna ANT-2.4-CW-RCL.

Section 7.1.5 of RSS-GEN

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

Table of Contents

Welcome to EMS

Tendril Energy Management System puts you in control of your monthly utility bill. Your EMS gives you direct visibility into the information you need to make smart choices about how you consume energy in your home:

❖ Up-to-date usage data

❖ Forecasted billing based on your consumption history and household profile

❖ Information on how you compare with similar households

Cycle your pool pump. Turn off your air conditioner while you are at work during the summer, or raise your thermostat a few degrees in the middle of day. Make sure your kids shut the front door in December. Day by day, you can see how small choices can affect your total usage, and your total utility bill, in a big way.

What is Tendril Energy Management System?

Tendril EMS works with your Smart Meter, computer, and Internet router to create a network of information in your home, as shown in Figure 1.
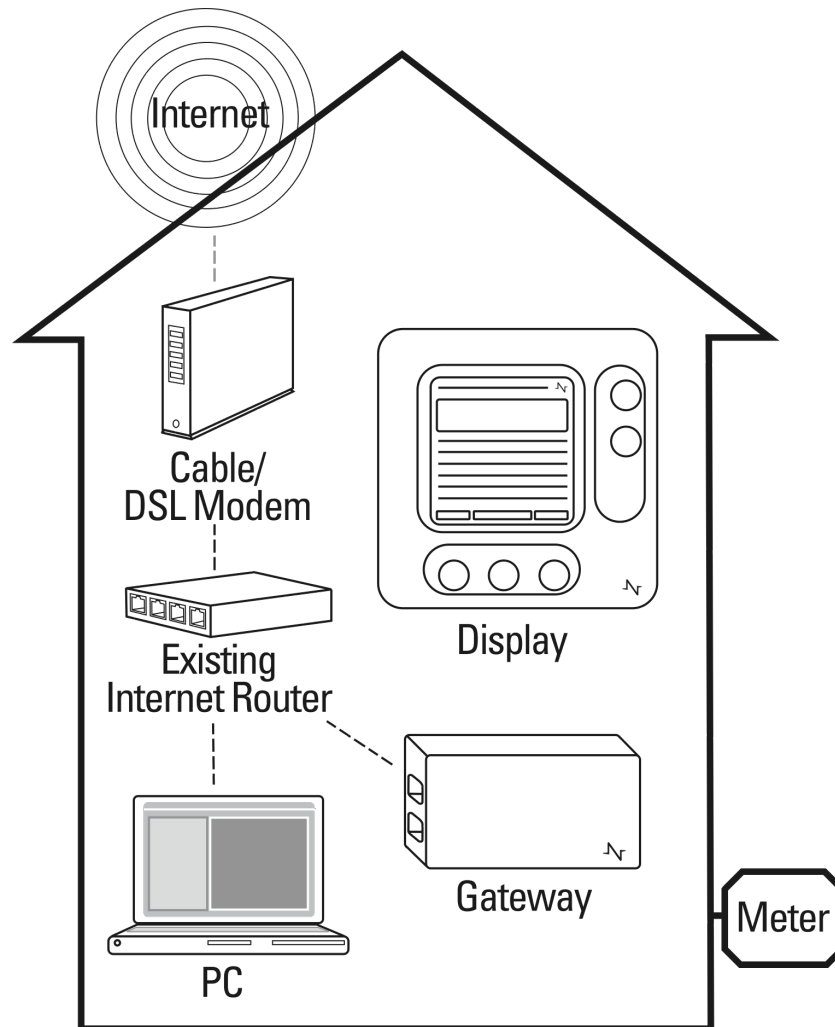
Figure 1. Your Energy Management System

Tendril EMS contains the following components:

- ❖ An **in-home display** provides a quick reference for you to see your current consumption and an estimated monthly bill. You can set alerts to notify you when key conditions occur, such as nearing a specific price point on your estimated bill.

- ❖ A web-based **consumer portal** allows you access to information to help you better understand, manage, and control the energy consumption in your home. Through the portal, you can register your energy management

components, set alerts and notifications, quickly assess current consumption through a dashboard, view historical and comparison data charts and graphs, and receive energy-related event messages.

❖ A **Gateway** provides the connectivity between your Smart Meter and the rest of the EMS.

❖ An optional Tendril Range Extender can be used to boost the signal between your Gateway and Smart Meter.

Providing Feedback

Energy management is a partnership between your utility supplier and you. EMS will continue to evolve to meet consumer needs. Your feedback is important in ensuring Tendril EMS continues to provide refined and effective tools as needed to support energy consumption management initiatives.

To report a specific request or concern, or to provide some general feedback:

1. In the lower right corner of your control panel, click **Contact Us**.

2. The **Contact Us** screen appears. Select the feedback tool that best fits your needs:

   • Send Us Feedback

   • Report a Problem

   • Take Our Survey

3. Click **Submit**.

Getting Help

For technical assistance in setting up and using your Tendril EMS, contact Customer Support using the information provided with your product set.

Setting up Your System

Your Tendril EMS kit contains three devices that work with your home computer and Smart Meter to complete your energy management system.

- ❖ Gateway, which is how your Home Area Network connects out through the Internet, and an Ethernet cable, and its power adaptor

- ❖ In-home Display and power adaptor

- ❖ Optional Tendril Range Extender, for use if your Smart Meter is more than 100-feet away from where you plug in your Gateway

To begin using your EMS, you need to connect your devices and then log in to the consumer portal and register your system.

Before You Begin

Before you begin the set up process, take a few minutes to make sure the computer you will use to access the consumer portal has the required

software and that your home environment is configured to support your EMS installation.

Check your System Requirements

To access the consumer portal to complete your set up and access your usage data, you need the following installed on your computer:

- An EMS-compatible Web browser:

Windows users:
- Internet Explorer 7.0 (Vista)
- Internet Explorer 6.0 (Win XP)
- Firefox (Vista)

Mac users:
- Firefox (Mac OS X)
- Safari (Mac OS X)

- Adobe Flash Player 9—Adobe distributes this player for free. If you don't already have it, your browser will prompt you to download it when you attempt to open the consumer portal. You can download the player from www.adobe.com/products/flashplayer.

Check your home environment

In addition to the ability to access the portal, you need to make sure your Tendril EMS components can connect with each other and with the Internet, so your system can send and receive information from your utility provider. Your Tendril EMS solution works with your existing Internet router.

1. Make sure you are connected to the Internet. If you aren't sure, open a browser and try to access your favorite Web site.

2. Find your Internet router and make sure it has an open port.

3. Take a minute and estimate how far your Smart Meter is from where you will be installing your Gateway. If this distance is more than 100 feet or you suspect your home configuration may cause problems for the network (e.g., a refrigerator sits against the wall behind the meter), you may need to use a Tendril Wireless Range Extender to boost your network.

> **How do I know if I have a router?**
>
> Most Internet service is delivered via a modem and a router, which may be built into the modem or a separate device. Your Internet router ensures that your computer and anything else in your house that has a private Internet address (like your EMS) can communicate across the public Internet. Routers also provide an important level of security.

Setting up your Tendril Energy Management System

To set up your EMS, you first create your home area network by turning on up your components and plugging your Gateway into your Internet router. After you've set up the network, you can log in to the consumer portal to register your devices and begin monitoring your power usage.
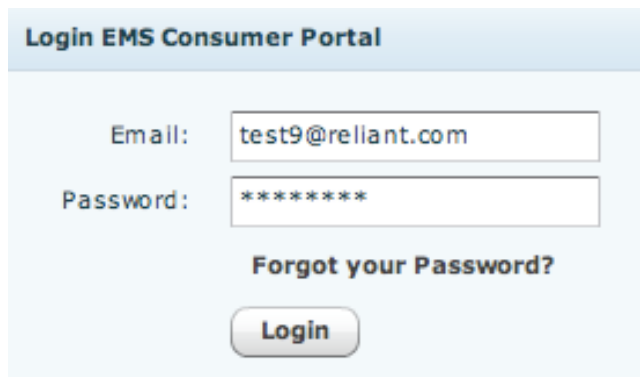
Create your Home Area Network

1. Use the Ethernet cable to connect the Gateway to your Internet router

   - A solid green light indicates the Gateway is on and connected to the Internet.

   - A second, blinking green light indicates the Gateway is looking for or receiving information from the Internet.

2. Plug your in-home display into a power outlet. The screen lights up and displays a message that the device successfully joined your home area network.

Register your devices

After you have successfully joined your components into a network, you are ready to register them. Registering your devices associates them with you so data collected from them can be tied back to your home.

1. From your computer, open a browser and navigate to the following address:

   https://www.tendrilems.com:9090/ems

2. The EMS Consumer Portal opens. Enter your home email address and the password provided with your solution, and then click **Login**.

Figure 2. Consumer Portal Log-in Screen

3. The New User Registration screen displays. Verify that your account information is correct. If you have questions or if any information is incorrect, please contact customer support using the contact information displayed on the screen. If the information is accurate, click **Continue**.

Figure 3. Account Validation

4. On the **Home Description** screen, select the options that best describe your home.

Figure 4. Home Description

5. Click **Continue**. The Complete Registration screen appears.

Figure 5. Gateway Registration

6. Select the checkbox if would like to include your usage data in summary reports that compare your household with similar ones. This gives you an easy reference point for determining whether you are consuming at atypically high (or low) levels. Personal information, such as name or address, is not included in these comparison reports.

   The comparison data is displayed in the Energy Consumption graph, in the Energy Usage section of the portal.

7. Enter the 16-character identifier that is printed on your Gateway. Click **Register Household**. The Device Setup screen displays.

8. The Found Devices list pre-populates with your Display and your Smart Meter. If the devices are not already listed, click **Find New Devices** to update the list.

9. In the Found Devices list, select a device. Its associated information appears in the information fields.

Figure 6. Register New Devices

10. Click **Register Device**. The device name clears from the Found Devices list. Repeat this step for each device listed in the Found Devices window.

After you have successfully registered each device, you are ready to begin using your Energy Management System.
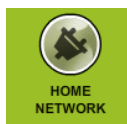
To view your in-home network, click **Home Network** in the left navigation panel of the portal.

Each of your registered devices displays in the Home Network grid.

Figure 7. Home Network

Click on any of the devices to view information about the component.

Using Your In-home Display

Tendril Energy Management System gives you a powerful resource to help you to proactively manage your home energy costs. Monitoring and interpreting your consumption data arms you with the information you need to make informed choices about your power use.

With a quick glance at your in-home display, you can view your current usage (kW) and the associated cost per hour, and set up alerts to notify if your usage exceeds a level you define. You can also view your month-to-date usage and corresponding month-to-date bill. In addition, your provider can send you announcements, such as an upcoming change in pricing or new service offering.

Viewing Information

The first time you set up and register your display, click **Home** to bring up your display's Home screen. From Home, you can quickly reference your current household consumption in terms of cost and actual consumption rate (kW per hour).

Your Display shows the following information:

- **Household Demand:** The current cost and amount of energy use per hour. This value is refreshed every 15 seconds to reflect current Smart Meter readings and active price information.

- **Month to Date:** The cumulative charges and energy usage since the last billing date.

- **Present Power Cost:** The current hourly cost of your power per kilowatt.

In addition to your usage data, the Home screen also provides some information about the health of your in-home network. The three bars that appear in the upper right of your screen indicate the status of your Display's network connectivity with other EMS components.

The Display monitors three status conditions:

- No bars: Your Display is not registered. Please refer to section 2, Setting up your EMS, for more information.

- 1 bar: Your Display is talking to either the Gateway or your Smart Meter.

- 3 bars: Your Display is talking to both your Smart Meter and your Gateway.

From **Home**, you can access your billing, messages, and preferences screens.

Navigating within Your Display

Use the three buttons along the bottom of your Display to navigate among the views and among options on a specific screen. Labels in the screen above the buttons indicate the associated view.

- **Bill:** Displays your Monthly Bill Estimate, which forecasts your bill based on past consumption history.

- **Messages:** Displays messages sent from your utility provider as well as any notifications generated based on alerts you have defined.

- **Prefs:** Accesses Preferences, which allows you to customize your notifications.

Use the Up and Down buttons to increment or decrement threshold values when you define your alerts.

Look Ahead with Your Monthly Bill

Your in-home display gives you quick access to your forecasted monthly bill, including the current month-to-date bill, number of days remaining in your billing period, and your projected total monthly bill amount.

To access your monthly billing data, click **Bill** on the Main screen.
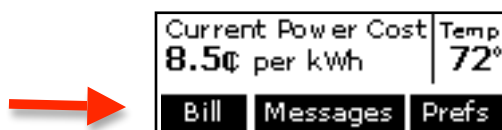
Your Estimated Monthly Bill appears.

Note: The first time you set up your Display, it can take as long as 48 hours for the estimated billing information to appear.
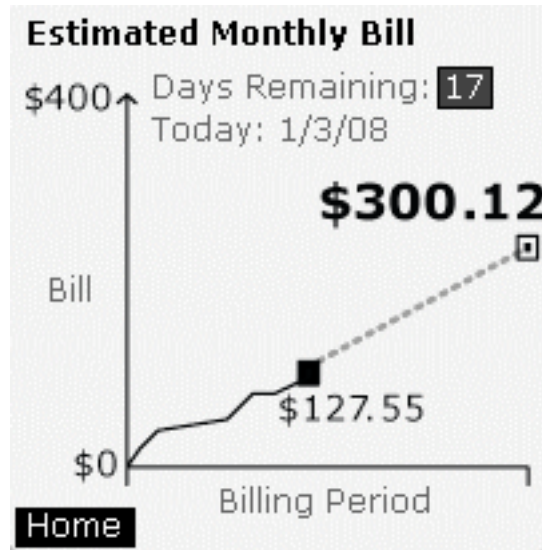
Figure 8. Estimated Monthly Bill

The data point in the middle of the graph shows your bill to date. The large number, $300.12 in the example above, is the estimated bill for the total billing period. The display highlights the amount of time left in your billing period. Your forecasted bill is based on your consumption history over the past 13 months.

Click **Home** to return to the Display's Home screen.

View Messages

The Tendril EMS Display's Messaging screen presents messages and notifications sent to you by your power provider, as well as information about alert conditions you specified, as described in Setting Alerts. When you receive a message, it appears on your Home screen until you acknowledge it. If the message sent is flagged as critical, the Display Up button flashes orange.

Older messages are available through the Messages screen.

1. To access your messages, click **Messages** on the Main Screen.

2. Click **Home** to return to the Home screen.

Setting Custom Alerts and Notifications

Alerts provide a way for you to proactively interact with your Tendril EMS, especially as you experiment with how adjusting some of your behaviors, such as regularly cycling the pump in your pool, actually effects change in your overall consumption. You can configure your in-home display to notify you if your power usage exceeds a specified threshold. Many consumers are more familiar with the amount due on their utility bill than their actual usage volume, so you can configure your display to alert you if your forecasted monthly bill exceeds a threshold you specify.

You can configure the type of event as well as how the notification is communicated, such as an audible alert or message on your Display.

Set an alert

Alerts and notifications are defined in the **Message Preferences** screen.

1. To access Message Preferences, click **Prefs** on the Main page.

   The following options display:
   - Price per hour
   - Monthly Bill
   - Household Demand
   - Energy Reduction Event (not available in this release)
   - Price Change (not available in this release)

   In addition to the events, the Message Preferences screen provides a link for configuring your audio alert behavior.
   - Audio

2. Press **Move**, the second button across the bottom of the Display, to navigate through the list of events and select the event you want to use to trigger the notification.

3. Press **Edit**, the far right button on the bottom of your Display, to display the screen where you can specify your alert threshold value.

4. Press the **Up** and **Down** buttons on the right of your Display to increment or decrement the value until you reach the desired level.

5. Press **Move** to scroll through the notification options.

> **Note:** Text Message and Email notification are not supported in this release.

6. For each option, press the **Up** or **Down** button to toggle between **Yes** and **No** to disable or enable the notification option. You may specify more than one notification method.

7. Click **Save** to return to the Message Preferences screen.

8. Click **Home** to return to your home display screen.

Configure your Audible Alert Settings

You can configure how the alarm emitted by your Display will sound when an alert occurs.

1. From the **Message Preferences** screen, select **Audio.**

2. Press **Move,** the middle button at the bottom of your Display, to navigate through the buzzer settings. Click the **Up** and **Down** arrows to navigate to the desired setting.

3. Click **Save**.

Clear an alert

When your Display triggers an alert, the **Up** button on the right side of your Display flashes yellow. Click this button to clear the alert. Until you acknowledge the alert, the screen displays the error message and sounds the audible alert, if configured.

Using the EMS Consumer Portal

The Tendril EMS consumer portal provides you a consolidated view of your energy consumption profile as well as a set of charts to help you decipher usage patterns and forecast future consumption rates.
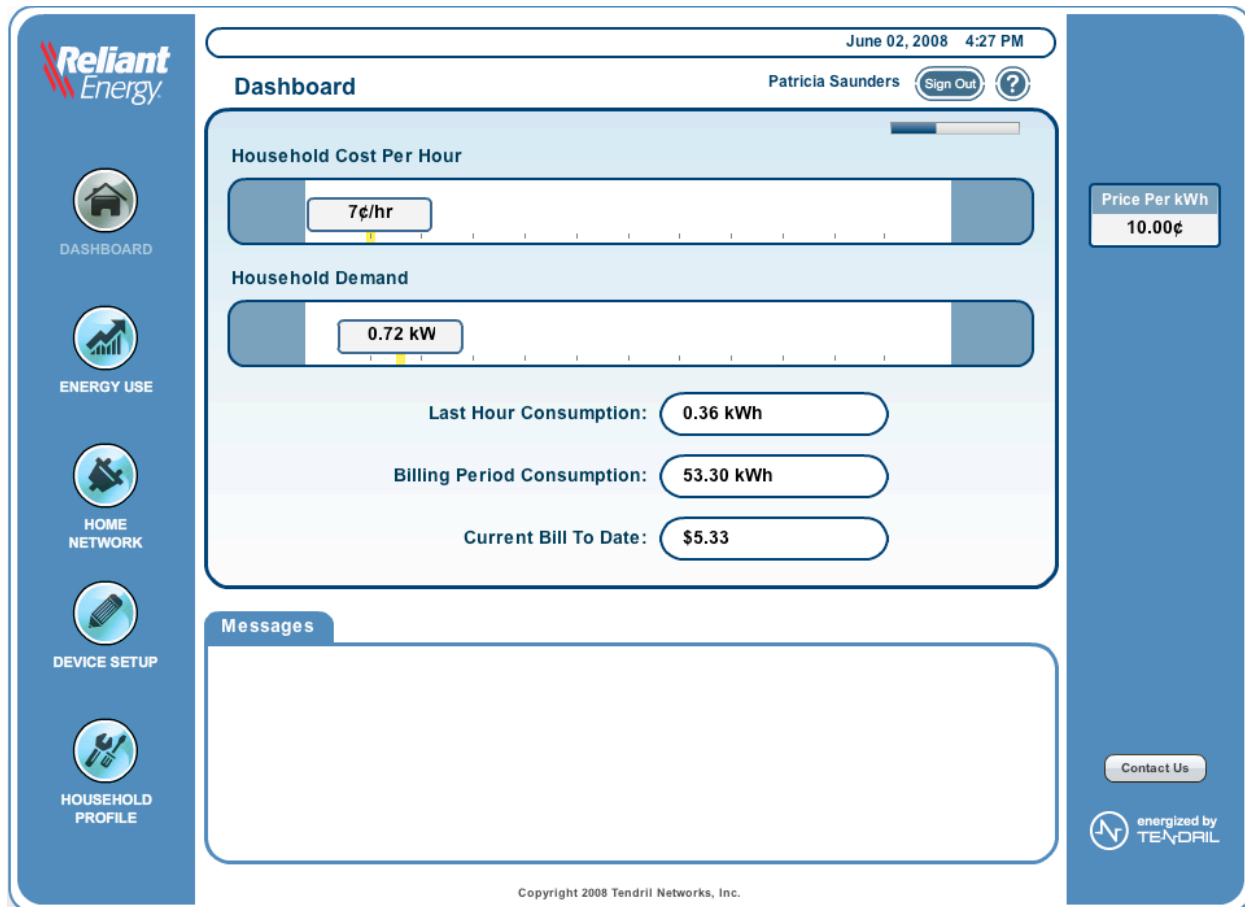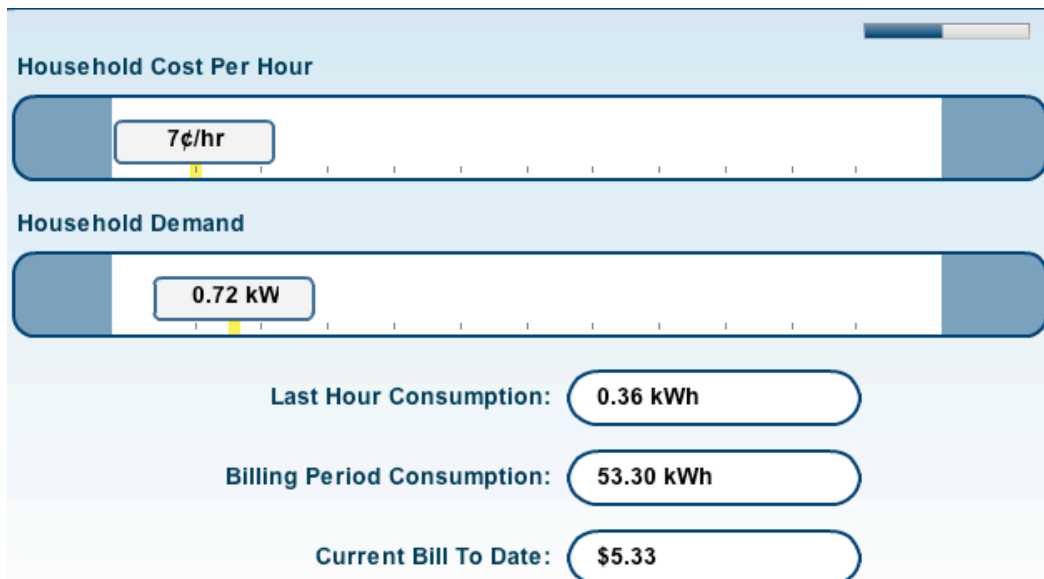
Figure 9. Consumer Portal Dashboard

From the Dashboard, you can see your Consumption dashboard screen provides user a view of current consumption, price level, cost per hour run-rate, and other near real-time meter and consumption data from the EMS. Data is updated every 30 seconds; a status bar indicates data refresh progress.

Household Cost Per Hour

7¢/hr

Household Demand

0.72 kW

Last Hour Consumption: 0.36 kWh

Billing Period Consumption: 53.30 kWh

Current Bill To Date: $5.33

ENERGY USE   The Energy Use screens provide more detailed views to help you better understand your consumption rates and patterns. In the Chart Choice box, at the bottom of the Energy Use screen, select which data you want to view.

Chart Choice	⦿ Monthly Bill Estimate
	◯ Billing History
	◯ Energy Consumption

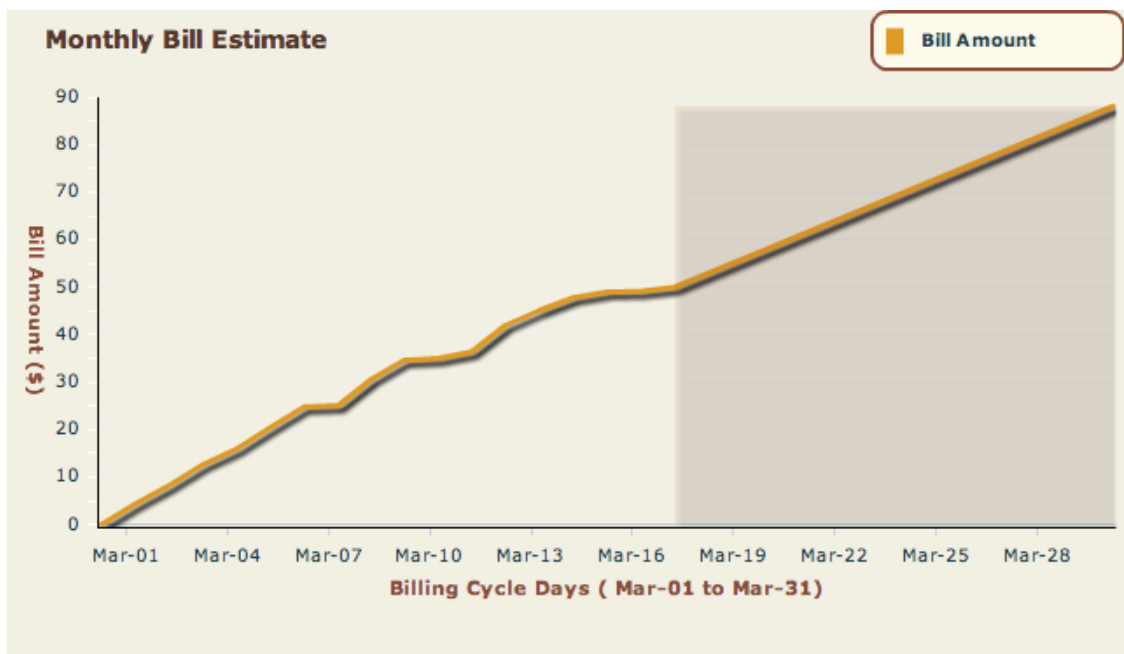The chart updates to reflect your selection.

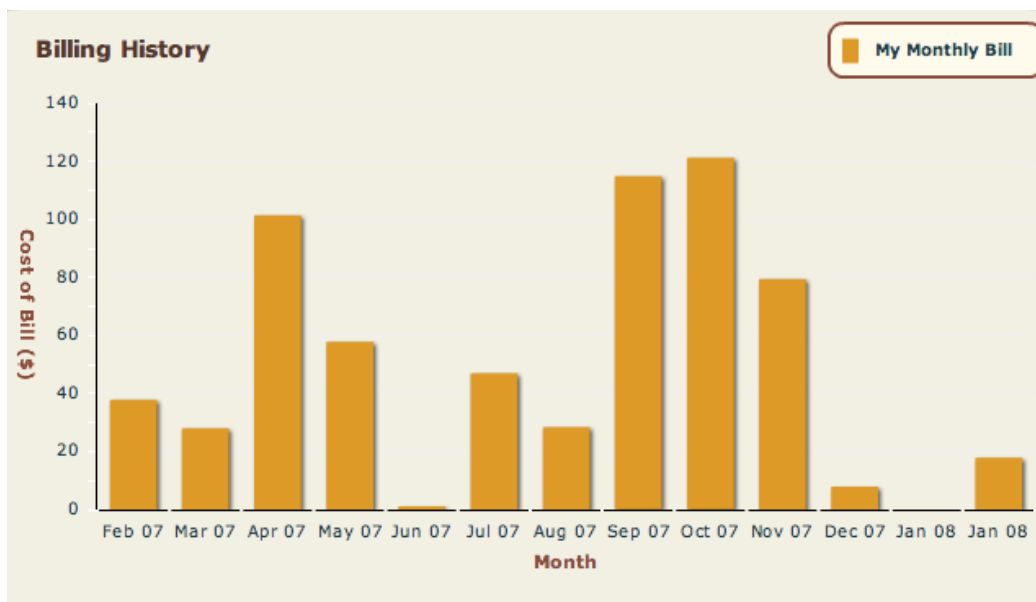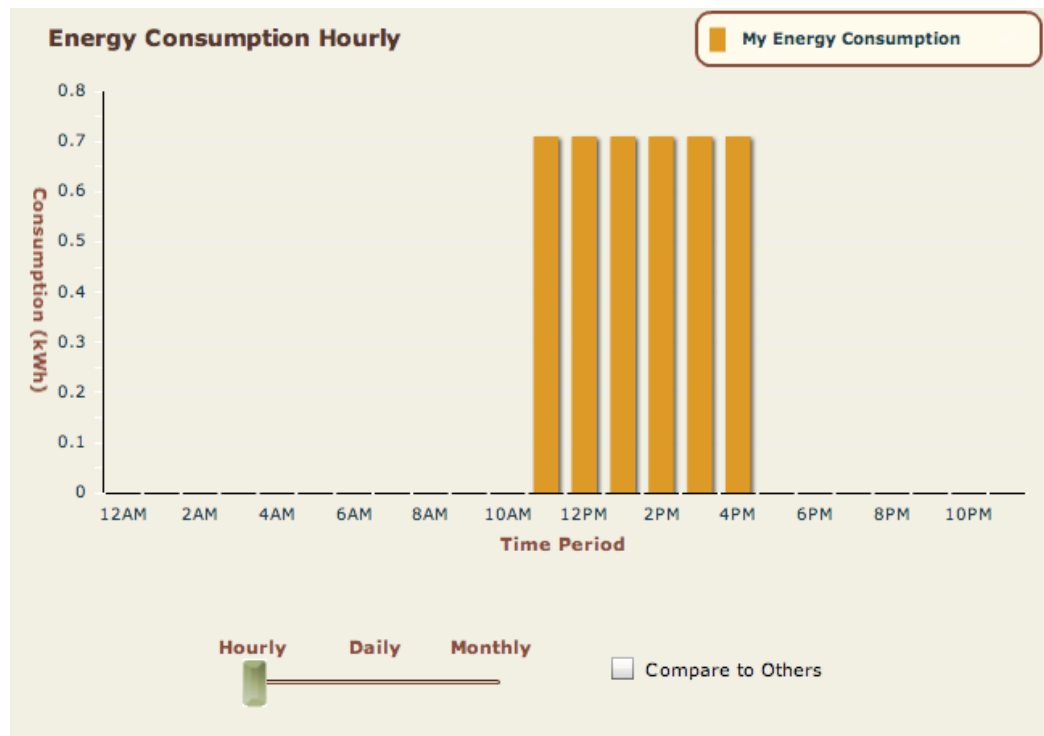Figure 10. Forecasted Bill

Figure 11. Billing History

Figure 12. Total Household Consumption and Comparison Report